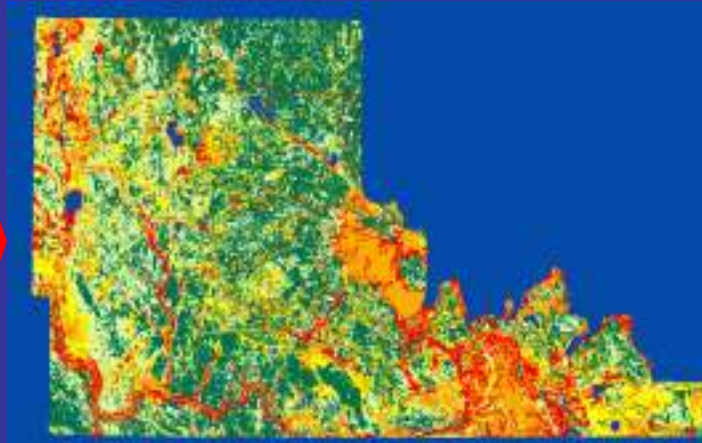
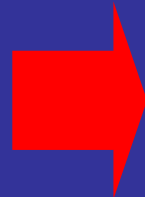
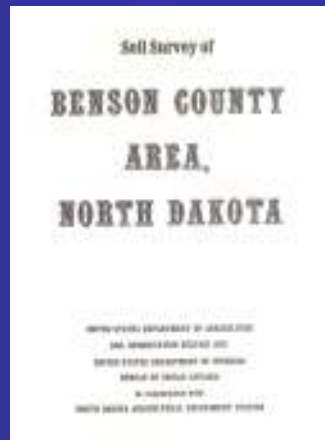


Soil Survey Geographic Database (SSURGO)



Creating Meaningful Data from Soil Survey Information

North Dakota GIS Users Conference

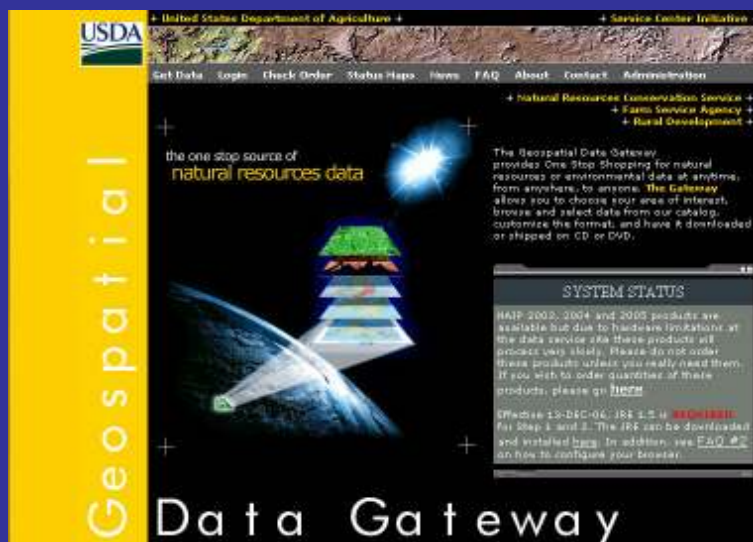
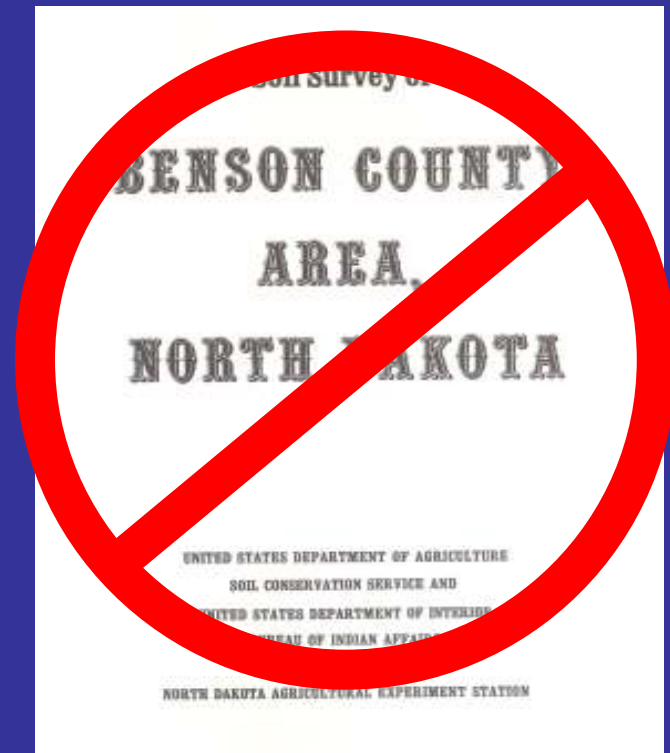


2007

So How Do I Go to get Soil Survey Information?

Soil Data Mart

Soil Data Viewer



http://www.soils.usda.gov/

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NRCS Natural Resources Conservation Service

Soils

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Welcome to the NRCS Soils Website.

"Helping People Understand Soils"

Soils is part of the National Cooperative Soil Survey, an effort of Federal and State agencies, universities, and professional societies to deliver science-based soil information.

Introducing Web Soil Survey 2.0

Web Soil Survey is now better than ever! Originally launched in August 2006, the improved and enhanced version is now available online. Based on user comments, [new features and enhancements](#) have been developed to make the program more responsive to its growing customer base. Some new features include a location marker, floating map unit descriptions, transparency layers, a topographic map layer, and the ability to create custom soil resource reports.

[More Info](#)

NCSS Training Website

A website has been developed to assist National Cooperative Soil Survey (NCSS) soil scientists and their supervisors in identifying training opportunities and resources. Links are provided for schedules, course descriptions, job aids to supplement training, and other helpful topics. GIS-related training includes: (1) GIS fundamentals for all soil scientists; (2) a recommended sequence of GIS-related training, especially for newly hired soil scientists; and (3) training for employees of all soil survey-related offices.

[More Info](#)

USDA Agriculture Handbook 296

The much improved 2006 edition includes text and color maps, enhanced and expanded descriptions of Land Resource Regions (LRRs) and Major Land Resource Areas (MLRAs) based on data from the 1997 National Resource Inventory (NRI), updated climate information based on the most recent Parameter-based Regression on Independent Slopes Model (PRISM), 39 new MLRAs, 2 new LRRs, color photographs, and water-use information for each LRR and MLRA.

While supplies last, the Handbook is available for free from LANDCARE by [clicking here](#) and searching for AH-296. PDF files are available by selecting "More Info" below.

[More Info](#)

Ground-Penetrating Radar Soil Suitability Maps

Ground-Penetrating Radar Soil Suitability Maps have been prepared for the conterminous United States, most states, and territories. These maps are based on attribute data contained in the STATSGO and SSURGO databases and offer service providers an indication of the relative suitability of soils to GPR.

[More Info](#)

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

Information For:

- Geographers
- Soil Scientists
- Land Use Managers
- Teachers and Students
- City and County Planners



One-Stop Shopping

Quick Access

- ▶ Hydric Soils
- ▶ List of Published Soil Surveys
- ▶ National Cooperative Soil Survey (NCSS)
- ▶ NRCS Technical Resources
- ▶ Official Soil Series Descriptions (OSD)
- ★ ▶ Soil Data Mart
- ★ ▶ Soil Data Viewer
- ▶ Soil Lab Data
- ▶ Soil Quality
- ▶ Soil Science Glossary
- ▶ Soil Series Extent Mapping Tool
- ▶ Soil Taxonomy
- ▶ State Soils
- ▶ STATSGO
- ▶ MLRA
- ▶ Web Soil Survey
- ▶ World Soils

Soil Data Mart

Official Source of SSURGO including Geospatial Datasets, Tabular Data & Reports



ArcGIS Tool to develop GIS-Ready Soil Interpretive Layers or create reports



Soil Data Mart

- Official Data Clearinghouse for SSURGO product
- Shapefile (Spatial) & Access Database (Tabular)
- Generate Interpretive Reports
- Subscribe to Soil Survey Area (Updates)






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Soil Data Viewer



Soil Data Viewer

- Extension for ArcGIS 8.3-9.1 or standalone
- Compute a single value for a map unit and display results spatially
- Basic Mode - Interpretations Only (eg. Paths, Trails & Golf Fairways)
- Advanced Mode - Interpretations & Properties (Cation Exchange Capacity, Salinity)
- Output is a temporary shapefile
- Just click on the  icon to launch







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Soil Data Viewer



SDV Analysis in GIS

- SSURGO Download from Soil Data Mart
- Install Soil Data Viewer off of the web
- Add Soil Data Viewer Tools to Map Document 
- Ensure Synchronization Status: All Mapunits in sync 
- Generate Map
- Query for Desired Property
- Clip Query to Boundary

Documentation & Downloads Available: <http://soildataviewer.nrcs.usda.gov/>





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Soil Data Viewer



SDV News

- Release v5.2 for ArcGIS 9.2 expected November 2006
- Workarounds Available for 9.2 users
- Web Soil Survey Eventually May Have Functionality to Replace SDV

Documentation & Downloads Available: <http://soildataviewer.nrcs.usda.gov/>





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Soil Data Viewer



When to use SDV instead of WSS?

- Analysis over large areas (eg. watershed)
- Non-contiguous/irregular Area of Interest
- When classes are too broad in WSS
- GIS Overlay Analysis



Soil Data Viewer - ArcMap

File View Help

Attribute Folders

- Building Site Development
- Construction Materials
- Disaster Recovery Planning
- Land Classifications
- Recreational Development
- Sanitary Facilities
- Soil Chemical Properties
- Soil Erosion Factors
- Soil Physical Properties
- Soil Qualities and Features
- Vegetative Productivity
 - Crop Productivity Index
 - Forest Productivity (ft3 per ac per yr)
 - Forest Productivity (Tree Site Indr)
 - Iowa Corn Suitability Rating
 - Potential Irrigated Crop Yield
 - Potential Irrigated Crop Yie
 - Potential Non-Irrigated C (ent)
 - Potential Non-Irrigater (Unit)
 - Range Production f
 - Range Productic
 - Range Produc (Year)
- Water Features
- Water Manap

Attribute/Folder Description Rating Options Report Options

Basic Options

Result Column Name: CropProdIn

Advanced Options

Aggregation Method: Weighted Average Method Description

Component Percent Cutoff

Components whose percent composition is below the cutoff value will not be considered. If no cutoff value is specified, all components in the database will be considered. The data for some contrasting soils of minor extent may not be in the database, and therefore are not considered.

Tie-break Rule

Lower Higher

The tie-break rule indicates which value should be selected from a set of multiple candidate values, or which value should be selected in the event of a percent composition tie.

Interpret Nulls as Zero

Yes No

This option indicates if a null value for a component should be converted to zero before aggregation occurs. This will be done only if a map unit has at least one component where this value is not null.

Basic Mode - Default Aggregation Minimal Criteria Set

Advanced Mode Define Aggregation

13 Categories (Folders)
69 interpretive values (not all ND)

Basic Mode Advanced Mode

Aggregation Report Map Unit Desc. Report Map Synchronize Clear Themes

Synchronization Status: All map units in sync.

Map Layer: C:\csp_pi\soil_nd003\spatial\soilmu_a_nd003.shp soilmu_a_nd003

Database: C:\csp_pi\soil_nd003\tabular\nd003.mdb



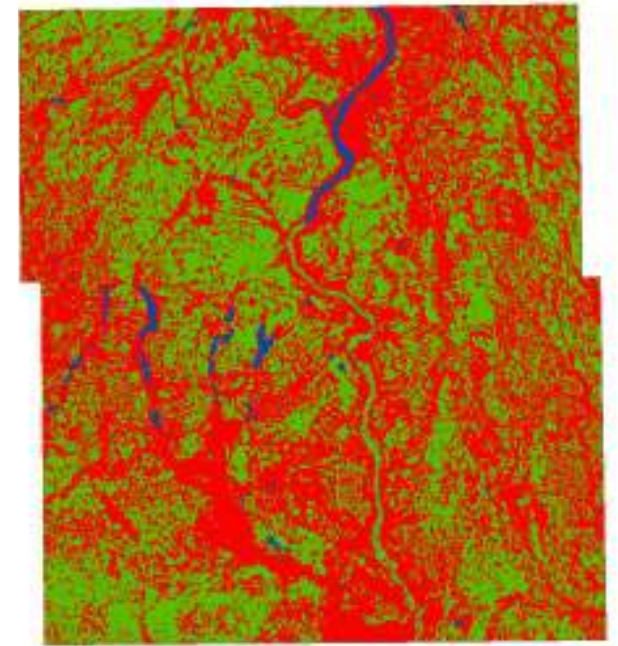
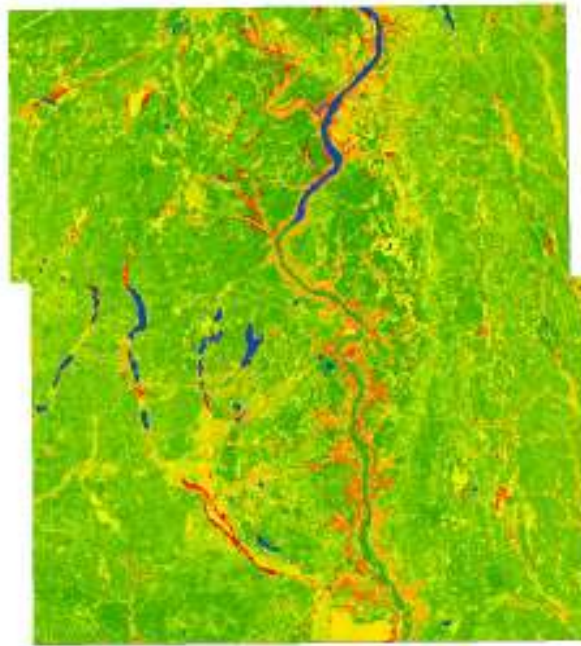
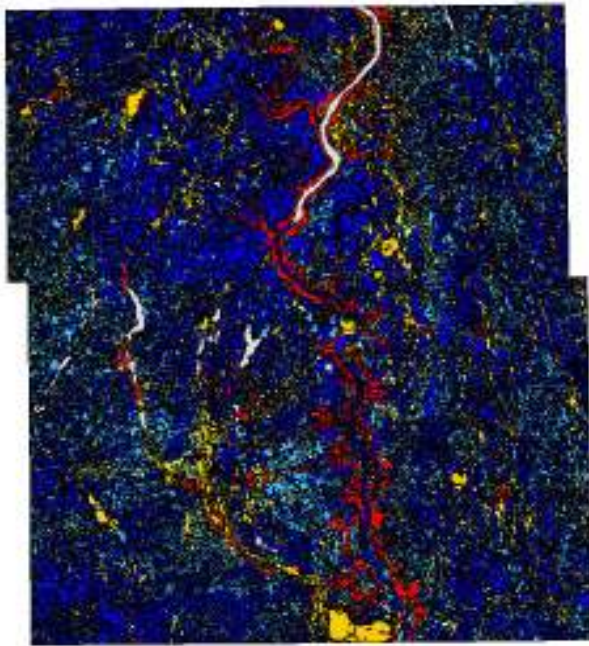


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Soil Data Viewer



Customize Results to Meet Needs



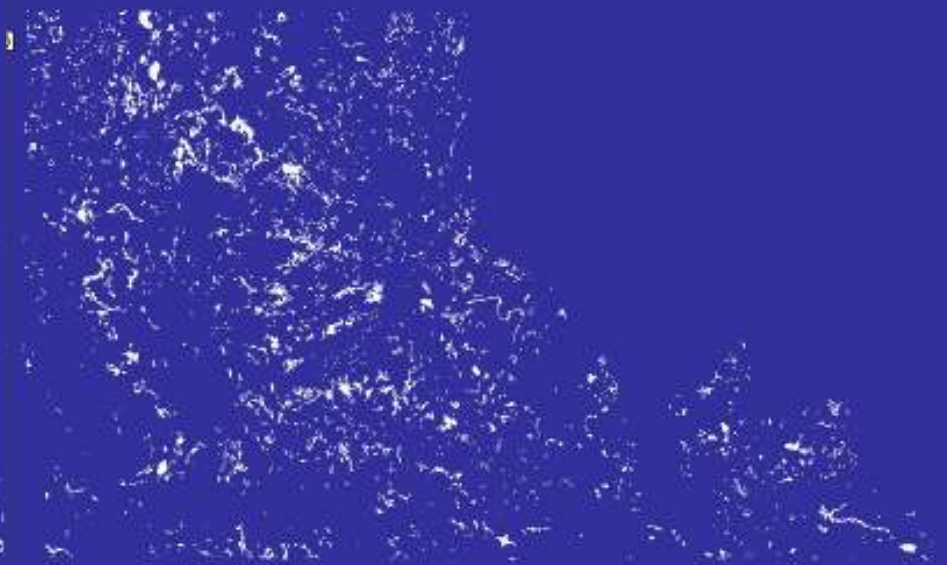
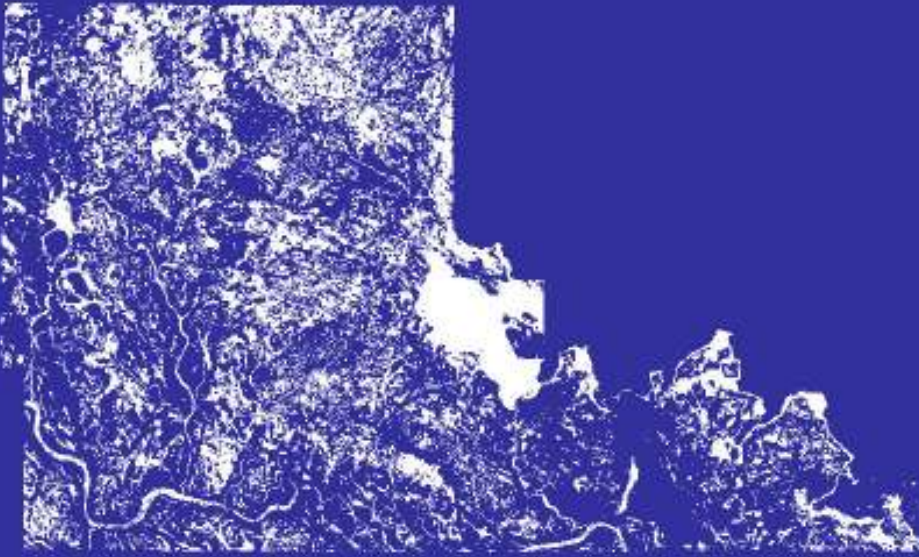
Default SDV:
Natural Breaks

Custom:
Defined Interval

Custom:
Yes/No



Interpreting Soil Interpretations



Linking Mapping Concepts to Ratings



Soil Mapping 1:20,000

ZmE

Zahl-Max-Bowbells Loams, 15-25% Slope



Component Aggregation

Vallers - 9%

Parnell - 5%

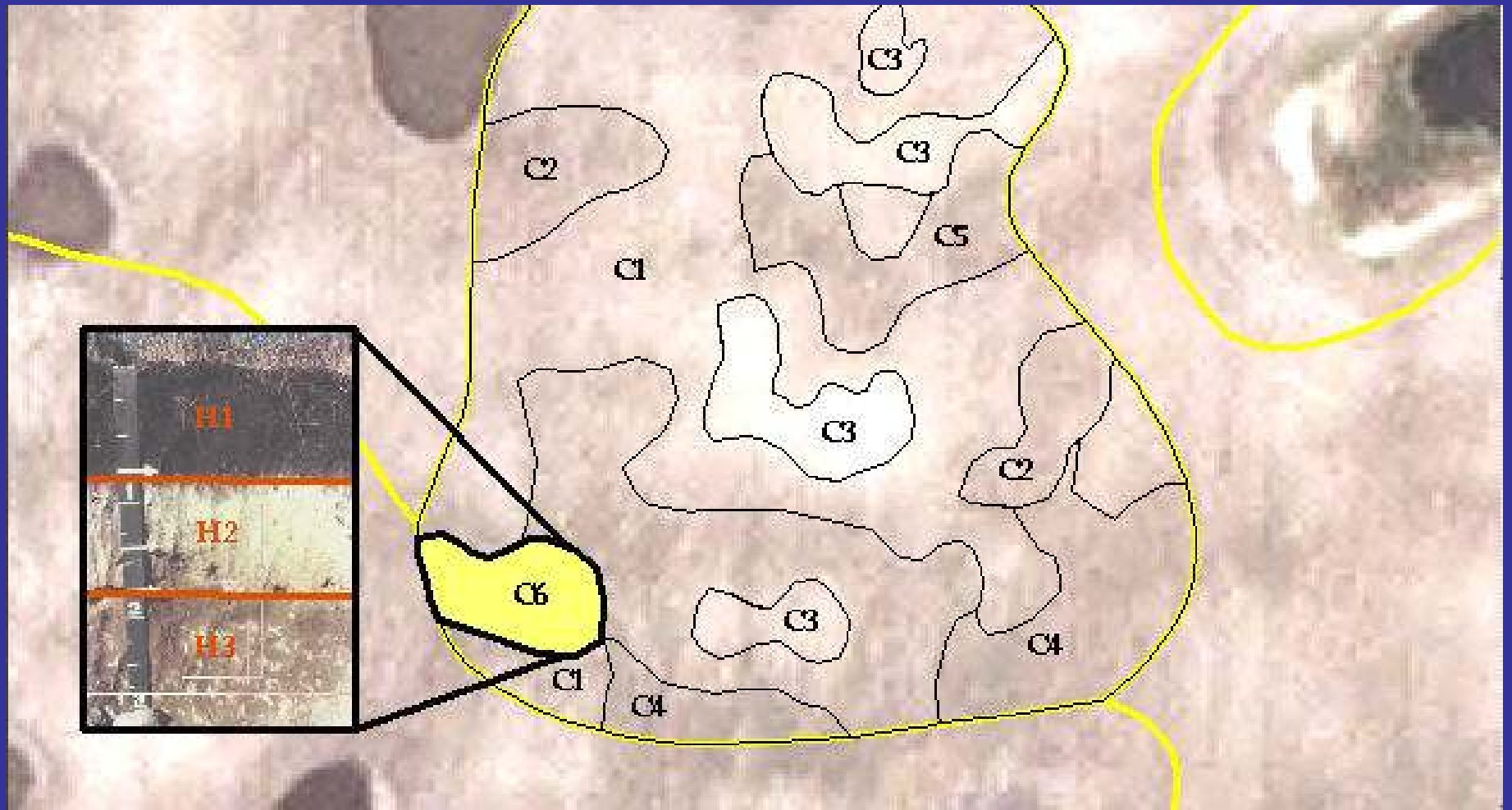
Max - 28%

Zahl - 32%

Bowbells - 26%



Horizon Aggregation



Component Aggregation

Selected Soil Property - Soil Erosion Factors: Kf

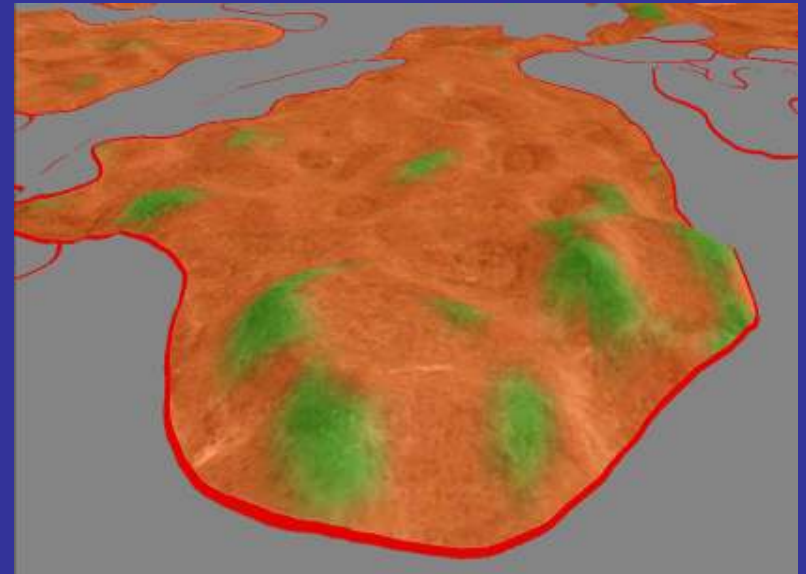
| Component | Composition | Kf |
|-----------|-------------|-----|
| Zahl | 32 | .30 |
| Max | 28 | .28 |
| Bowbells | 26 | .24 |
| Hamerly | 9 | .24 |
| Parnell | 5 | .28 |



Aggregation Method

Dominant Component

.30



| Component | Composition | Kf |
|-----------|-------------|-----|
| Zahl | 32 | .30 |
| Max | 28 | .28 |
| Bowbells | 26 | .24 |
| Vallers | 9 | .24 |
| Parnell | 5 | .28 |

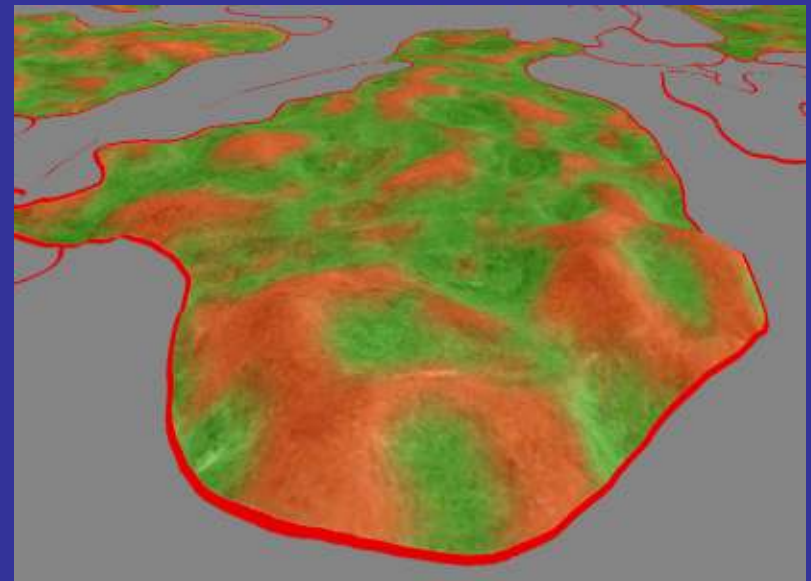
“Dominant Soil”



Aggregation Method

Dominant Condition

.24



| Component | Composition | Kf |
|-----------|-------------|-----|
| Zahl | 32 | .30 |
| Max | 28 | .28 |
| Bowbells | 26 | .24 |
| Vallers | 9 | .24 |
| Parnell | 5 | .28 |

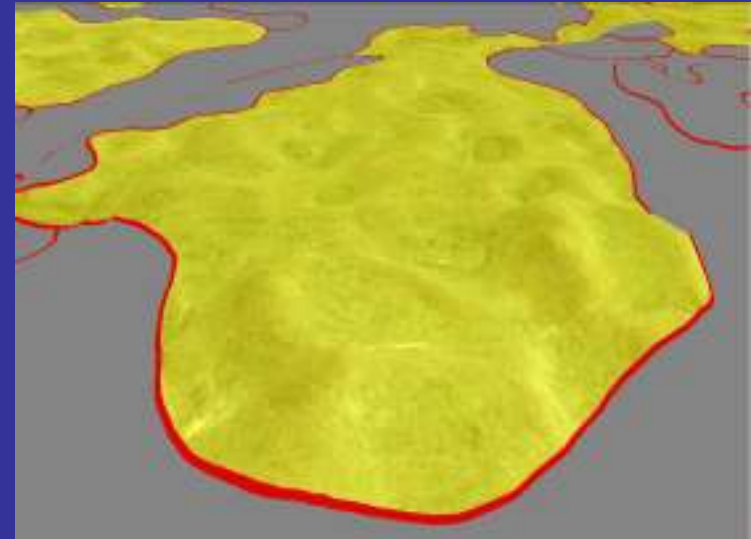
“Dominant Property”



Aggregation Method

Weighted Average

.27



| Component | Composition | Kf | |
|-----------|-------------|----|-----------|
| Zahl | 32 | X | .30 0.8 |
| Max | 28 | X | .28 1.3 |
| Bowbells | 26 | X | .24 1.2 |
| Vallers | 9 | X | .24 0.6 |
| Parnell | 5 | X | .28 + 0.4 |

“Average Property Value”



Aggregation Method

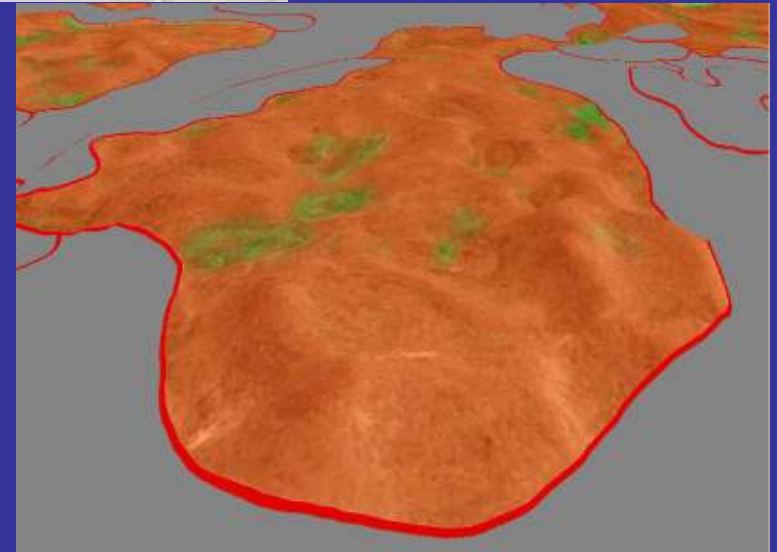
All Components

Tie-break Rule

☐ Lower

☒ Higher

.30



| Component | Composition | Kf |
|-----------|-------------|-----|
| Zahl | 32 | .30 |
| Max | 28 | .28 |
| Bowbells | 26 | .24 |
| Vallers | 9 | .24 |
| Parnell | 5 | .28 |

“Extreme Value”



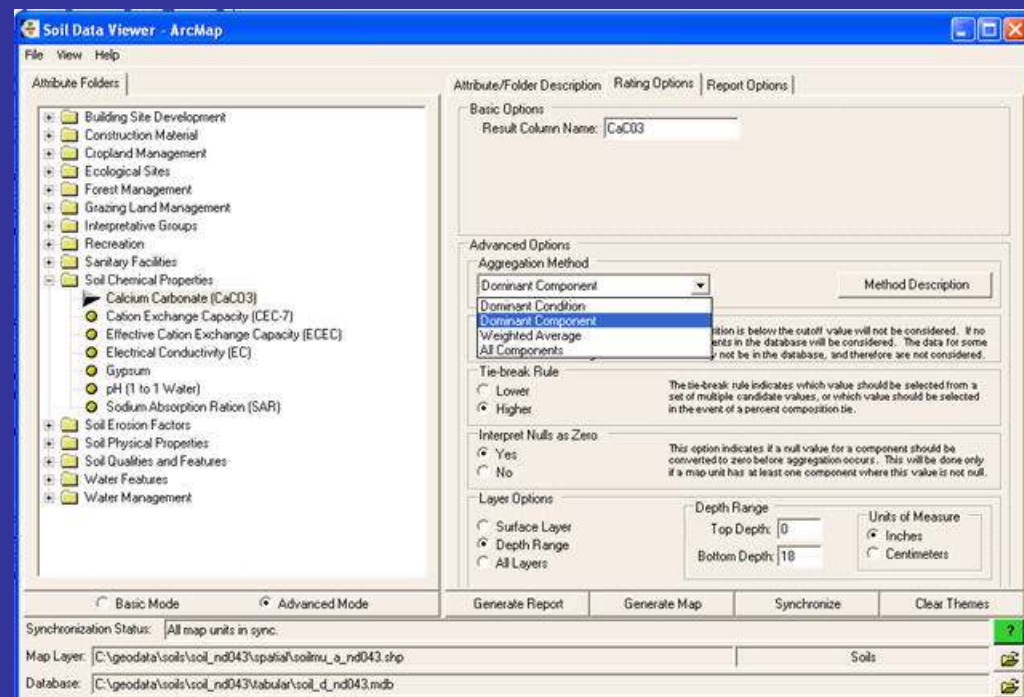


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Case Study: Drainage Class values in Stark County

- A) What is the drainage of the first named soil?
- B) What is the dominant drainage?
- C) What are the drainage extremes?





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Aggregation Method

Dominant Component

Dominant Condition

Dominant Component

Weighted Average

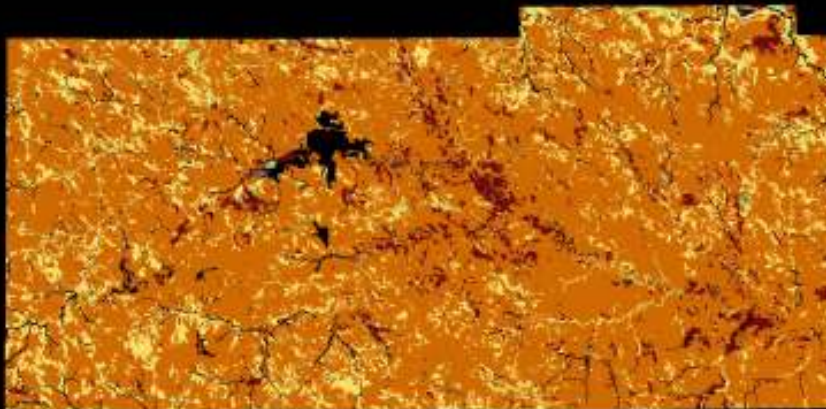
All Components

What is the drainage of the first named soil?

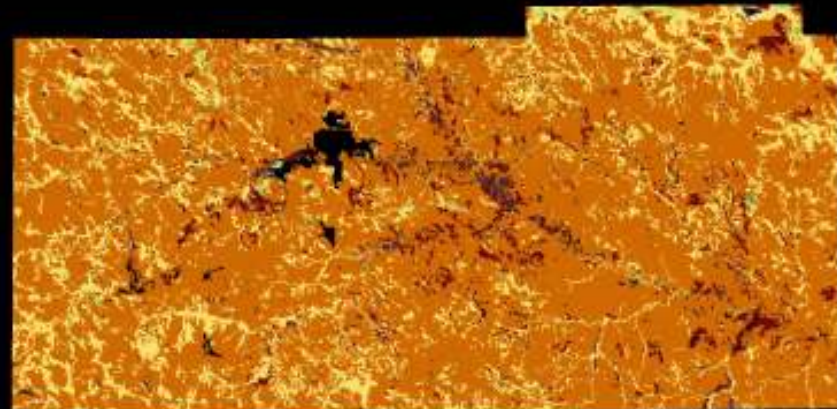
Aggregation Method?

What is the dominant drainage?

Aggregation Method?



Dominant Component



Dominant Condition





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Soil Data Viewer



Aggregation Method

Dominant Component

Dominant Condition

Dominant Component

Weighted Average

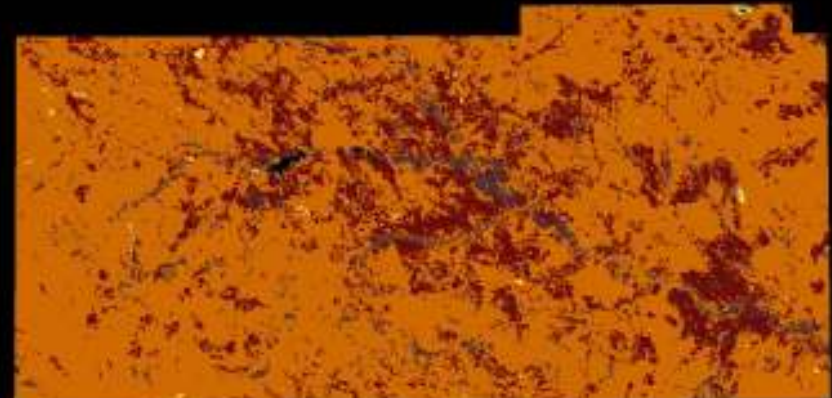
All Components

What are the drainage extremes?

Aggregation Method?



All Components (High)



All Components (Low)



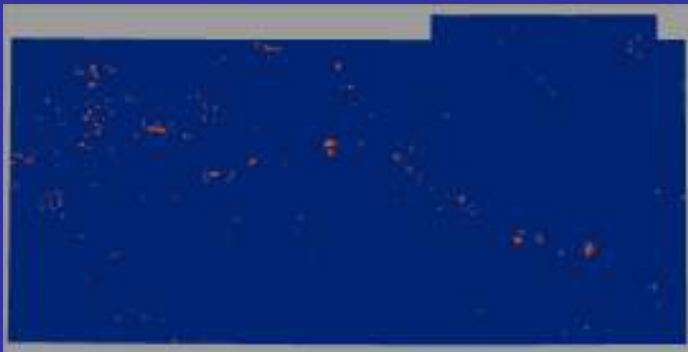
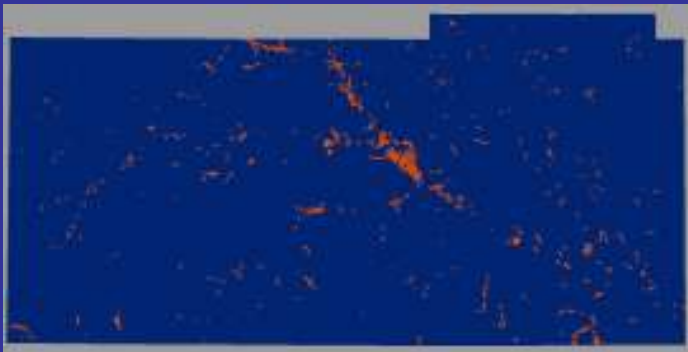


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Excessively Drained Results in SDV*

| Aggregation | Acres | Polygons | County | |
|--------------------|--------|----------|--------|---|
| Dominant Component | 3,000 | 220 | 0.3% |  |
| Dominant Condition | 10,200 | 458 | 1.2% |  |



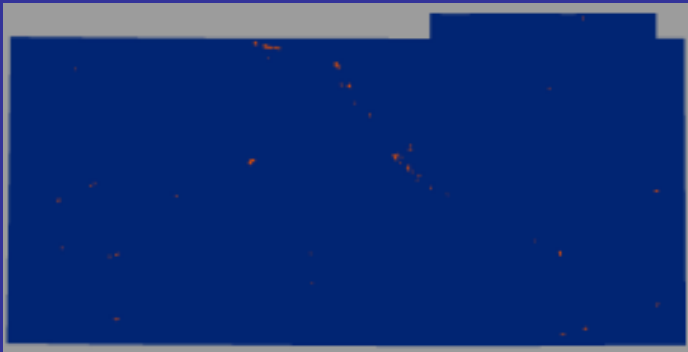
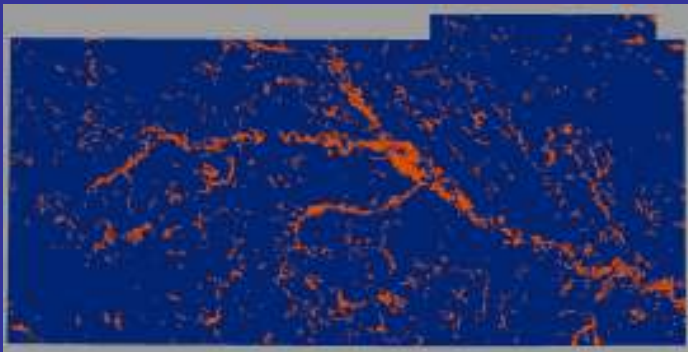


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Excessively Drained Results in SDV*

| Aggregation | Acres | Polygons | County | |
|-----------------------|--------|----------|--------|---|
| All Components (High) | 600 | 44 | 0.0% |  |
| All Components (Low) | 45,500 | 2,372 | 5.2% |  |



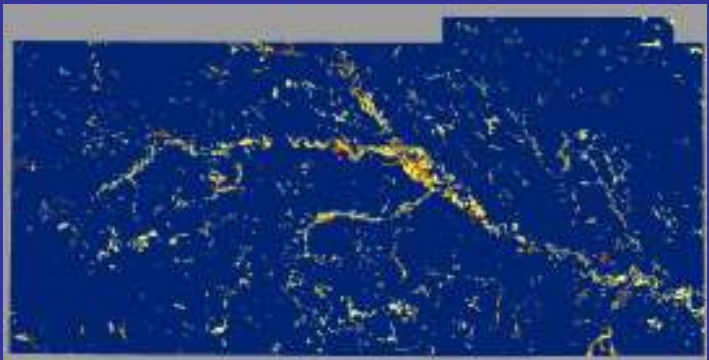


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Excessively Drained Soils – Best Estimate

| Aggregation | Acres | Polygons | County | |
|------------------------|-------|----------|--------|--|
| Composition Summary | 7,300 | 2,372 | 0.8% |  |





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Data
Viewer



General Rules of Thumb

Default Method is A Good Place to Start

Qualitative Data – Dominant Condition

Quantitative Data – Weighted Average

Choose Aggregation Method to Suit Needs

